

CLAIMS

What is claimed is:

1. A liquid dispensing apparatus comprising: a container storing an aqueous sterile liquid, the container providing an interior volume; a dispensing means engaged with the container for expressing the sterile liquid from the container; a substrate of a porous, three-dimensional matrix immersed within the liquid, the substrate providing an anti-microbial coating providing at least 4 square centimeters of surface area for each cubic centimeter of the interior volume of the container.  
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2. The apparatus of claim 1 wherein the matrix is at least one of: small particles, and a wool-like material, the matrix compressed within a porous pocket.  
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3. The apparatus of claim 1 wherein the substrate is a high porosity sponge-like material.  
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4. The apparatus of claim 1 wherein the matrix is a high porosity tightly wound sheet stock.  
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5. The apparatus of claim 1 wherein the coating on the matrix is an antimicrobial agent or combination of agents.  
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6. The apparatus of claim 1 wherein the dispensing means is at least one of: a needle and syringe, an ophthalmic tip and a nozzle.  
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7. The apparatus of claim 1 wherein the coating is applied by at least one of: dip coating, spray coating, electroplating, plasma deposition, plasma spraying, and vacuum deposition.  
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8. The apparatus of claim 7 wherein the coating is held on the substrate by adsorption, absorption, diffusion, mechanical bonding, chemical bonding, co-polymerization, and blending.  
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9. A method for dispensing a liquid, the method comprising the steps of: providing a container storing a sterile aqueous liquid, the container providing an interior volume; engaging a dispensing means with the container for expressing the sterile liquid from the container; coating a matrix material with an antimicrobial coating with the matrix  
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material disbursed or spread out, the coating providing at least 4 square centimeters of surface area for each cubic centimeter of the interior volume of the container; and compacting the matrix material into a porous, three-dimensional matrix immersed within the liquid.

- 5        10. The method of claim 9 further comprising the step of forming the matrix of at least one of: small spheres and a wool-like material, the matrix compressed within a porous pocket.
- 10      11. The method of claim 9 further comprising the step of forming the substrate from a high porosity sponge-like material.
- 11      12. The method of claim 9 further comprising the step of forming the matrix of a compressed high porosity sheet stock.
- 12      13. The method of claim 9 further comprising the step of forming the coating on the matrix of at least one of: an alcohol, an anilide, a metal salt, propiolactones, quaternary ammonium compounds, a biguanide, an iso-thiazolone, and a triclosan.
- 13      14. The method of claim 9 further comprising the step of forming the dispensing means of at least one of: a needle and syringe, an ophthalmic tip and a nozzle.
- 14      15. The method of claim 9 further comprising the step of coating the matrix with an antimicrobial agent or combination of agents.
- 15      16. The method of claim 15 further comprising the step of adhering the coating to the substrate by adsorption, absorption, diffusion, mechanical bonding, chemical bonding, co-polymerization, and blending.